

PATENT SPECIFICATION

DRAWINGS ATTACHED

847,513



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COMPLETE SPECIFICATION

Improvements in or relating to Diaphragm Check valves

I, HEINZ WERNER WALDENMAIER, a German National, trading as the firm JOHANNES ERHARD H. WALDENMAIER ERBEN, of 2, Hermann Loens-Weg, Heidenheim (Brenz), Germany, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention concerns diaphragm check valves, or non-return valves for pipe lines carrying fluids such as air, oil, lye and acid.

An object of the invention is to provide a novel construction of valve which is inexpensive to produce and will function efficiently and reliably in any of the fluids mentioned above.

According to the present invention there is provided a diaphragm check valve comprising a housing including a bridge piece or protrusion projecting into the flow path and constituting a valve seat, and a deformable diaphragm including a depending lip or tongue which, in the closed condition of the valve, and unflexed condition of the diaphragm, abuts against and seals across the whole width of the bridge piece or protrusion by seating thereagainst and partially embracing that member, but which can be lifted off its seat by fluid pressure to allow normal flow through the valve, there being at least one aperture in the diaphragm whereby back flow of fluid which has passed the bridge piece or protrusion is enabled to act on the diaphragm to urge the lip or tongue back onto the seat.

The invention will now be described further, by way of examples, with reference to the accompanying drawing, in which:

Fig. 1 is a longitudinal vertical section showing a check valve in accordance with the invention;

Fig. 2 is a plan view showing the diaphragm of the valve of Fig. 1;

Figs. 3, 4 and 5 are plan views showing

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three alternative embodiments of diaphragm;

Fig. 6 is a vertical section taken along the line X—X of Fig. 3 or Fig. 4; and

Fig. 7 is a vertical section taken along the line Y—Y of Fig. 5.

Referring to Fig. 1, the valve comprises a housing 7 having an opening wherein is secured a deformable diaphragm 3 of rubber or other suitable flexible material, being clamped into position by a cover 1. This cover 1 may be of transparent material or it may be constructed (e.g. by provision of a suitable connection thereon) so that a sight glass may be connected thereto, to permit flow or pressure conditions in the valve to be inspected.

The housing 7 has an integral bridge piece or protrusion 4 which projects into the flow path (indicated by the arrow in Fig. 1) and the diaphragm 3 is shaped to provide, in its unflexed condition a depending tongue or lip 2 which abuts against the bridge piece or protrusion 4 and seals across the whole width of the latter. The shape of the diaphragm 3 is shown in Fig. 2, and as can be seen, an aperture 8 is provided therein so as to be disposed substantially wholly to one side of the lip 2, the position of which has been indicated diagrammatically in this figure by the dotted line 2a.

As is shown in Fig. 1, the diaphragm 3 may be provided with a reinforcement, shown generally at 5, which may be of fabric (e.g. linen) or of metal (e.g. spring wire) such reinforcement being omitted in the region of the lip 2.

In use, fluid flowing through the valve in the direction of the arrow will raise the lip 2 from the bridge piece or protrusion 4, for example to the position shown in dotted line, 85 and will flow through the valve.

Should any back flow occur in the fluid which has passed the bridge piece or protrusion 4, the pressure thereof will, by virtue of the aperture 8, act upon the side of the dia-

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phragm remote from the bridge piece or protrusion 4, so pressing the lip 2 into tight sealing engagement with the bridge piece or protrusion.

5 In valves of large size, undue flexing of the diaphragm is prevented by the provision of a supporting element 6.

Figs. 3 to 5 show plan views of three alternative embodiments of diaphragm suitable 10 for use in valves in accordance with the invention. A vertical section as viewed along the line X—X of the diaphragms of Figs. 3 and 4 would be as shown in Fig. 6, whilst Fig. 7 is a vertical section of the diaphragm 15 of Fig. 5 taken along the line Y—Y thereof. Each of these three alternative embodiments has a lip 2 located, when viewed in plan, in the region indicated in Figs. 3 to 5 by the dotted lines 2a. In each of these 20 embodiments differently shaped apertures 8 are provided according to the desired flow characteristic of the valve and the medium intended to be passed therethrough.

WHAT I CLAIM IS:—

25 1. A diaphragm check valve comprising a housing including a bridge piece or protrusion projecting into the flow path and providing a valve seat, and a deformable dia- phragm including a depending lip or tongue 30 which, in the closed condition of the valve, and unflexed condition of the diaphragm, abuts against and seals across the whole width of the bridge piece or protrusion, by seating thereagainst and partially embracing

that member, but which can be lifted off its 35 seat by fluid pressure to permit normal flow through the valve, there being at least one aperture in the diaphragm whereby back flow of fluid which has passed the bridge piece or protrusion is enabled to act on the 40 diaphragm to urge the lip or tongue back onto the seat.

2. A valve as claimed in Claim 1 where- 45 in the diaphragm is reinforced, except in the region of the lip or tongue.

3. A valve as claimed in Claim 1 or 2 wherein the diaphragm is secured to the housing by a cover of transparent material.

4. A diaphragm check valve substantially as hereinbefore described with reference to 50 and as illustrated in Figs. 1 and 2 of the accompanying drawing.

5. A diaphragm check valve as claimed in Claim 4 modified substantially as herein described with reference to and as illustrated in 55 Figs. 3 and 6 of the accompanying drawing.

6. A diaphragm check valve as claimed in Claim 4 modified substantially as herein described with reference to and as illustrated in 60 Figs. 4 and 6 of the accompanying drawing.

7. A diaphragm check valve as claimed in Claim 4 modified substantially as herein described with reference to and as illustrated in 65 Figs. 5 and 7 of the accompanying drawing.

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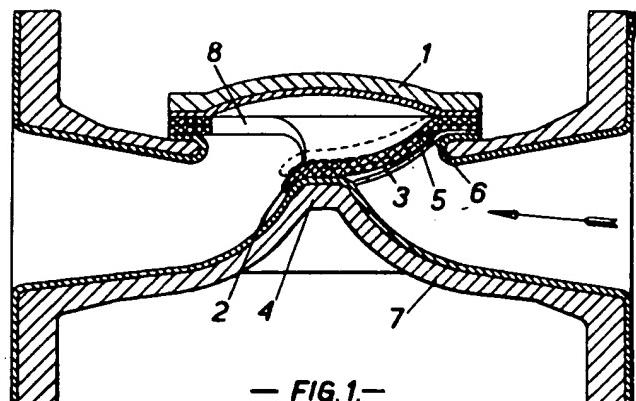
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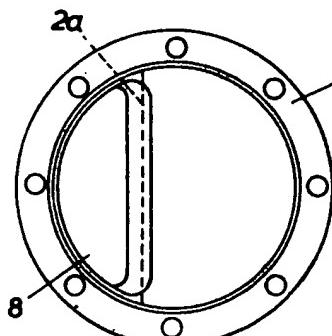
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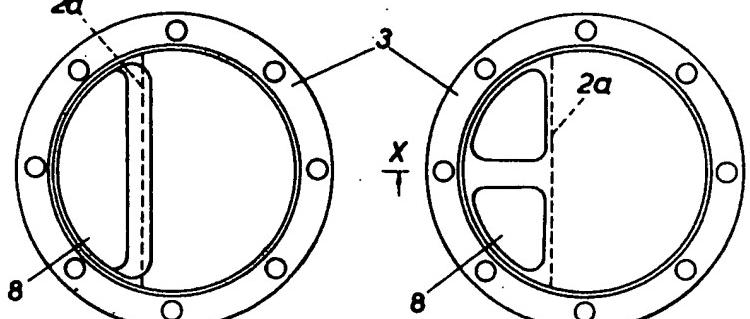
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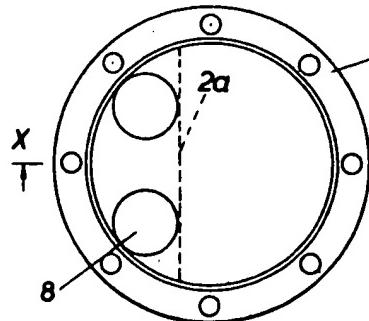
— FIG. 1.—



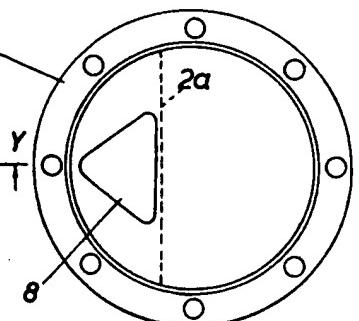
— FIG. 2.—



— FIG. 4.—



— FIG. 3.—



— FIG. 5.—



— FIG. 6.—



— FIG. 7.—

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